

NOV 10 2003

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)

Sheet 1 of 7

**Complete If Known**

Application Number	10/737,400
Filing Date	December 16, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	Not yet assigned
Examiner Name	Not yet assigned

Attorney Docket Number IMM103A (51851/295861)

**U.S. PATENT DOCUMENTS**

Examiner Initials *	Cite No. <sup>1</sup>	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columna, Lines, Where Relevant Passages or Relevant Figures Appear
		Number - Kind Code <sup>2</sup> (if known)			
JD	1	2,972,140	2/14/1961	Hirsch	
	2	3,157,853	11/17/1964	Hirsch	
	3	3,220,121	11/30/1965	Cutler	
	4	3,497,668	2/24/1970	Hirsch	
	5	3,517,446	6/30/1970	Corlyon et al.	
	6	3,623,064	11/23/1971	Kagan	
	7	3,902,687	9/21/1975	Hightower	
	8	3,903,614	9/9/1975	Diamond et al.	
	9	3,911,416	10/7/1975	Feder	
	10	3,919,691	11/11/1975	Noll	
	11	4,160,508	7/10/1979	Salisbury, Jr.	
	12	4,236,325	12/2/1980	Hall et al.	
	13	4,262,549	4/21/1981	Schwellenbach	
	14	4,333,070	6/1/1982	Barnes	
	15	4,414,984	11/15/1983	Zarudiansky	
	16	4,464,117	8/7/1984	Foerst	
	17	4,484,191	11/20/1984	Vavra	
	18	4,513,235	4/23/1985	Acklam et al.	
	19	4,581,491	4/8/1986	Boothroyd	
	20	4,599,070	7/8/1986	Hladky et al.	
	21	4,706,294	11/10/1987	Ouchida	
	22	4,708,656	11/24/1987	de Vries et al.	
	23	4,713,007	12/15/1987	Alban	
	24	4,731,603	3/15/1988	McRae et al.	
	25	4,794,392	12/27/1988	Selinko	
	26	4,795,296	1/3/1989	Jau	
	27	4,868,549	9/19/1989	Affinito et al.	
	28	4,885,565	12/5/1989	Enbach	
	29	4,891,764	1/2/1990	McIntosh	
	30	4,930,770	6/5/1990	Baker	
	31	4,934,694	6/19/1990	McIntosh	
	32	5,019,761	5/28/1991	Kraft	
	33	5,022,384	6/11/1991	Freels et al.	
	34	5,022,407	6/11/1991	Horch et al.	
	35	5,035,242	7/30/1991	Franklin, et al.	
	36	5,038,089	8/6/1991	Szakaly	
	37	5,078,152	1/7/1992	Bond et al.	
	38	5,103,404	4/7/1992	McIntosh	
	40	5,107,262	4/21/1992	Cadoz et al.	
	41	5,146,566	9/8/1992	Hollis, Jr. et al.	
	42	5,165,897	11/24/1992	Johnson	
	43	5,175,459	12/29/1992	Danial et al.	

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO			<i>Complete if Known</i>	
			Application Number	10/737,400
			Filing Date	December 16, 2003
			First Named Inventor	Louis B. Rosenberg
			Art Unit	Not yet assigned
			Examiner Name	Not yet assigned
Sheet	2	of	7	Attorney Docket Number
				IMM103A (51851/295861)

2D	44	5,184,319	2/2/1993	Kramer	
	45	5,186,629	2/16/1993	Rohen	
	46	5,186,695	2/16/1993	Mangseth et al.	
	47	5,203,563	4/20/1993	Loper, III	
	48	5,212,473	5/18/1993	Louis	
	49	5,240,417	8/31/1993	Smithson et al.	
	50	5,271,290	12/21/1993	Fischer	
	51	5,275,174	1/4/1994	Cook	
	52	5,283,970	2/8/1994	Aigner	
	53	5,296,871	3/22/1994	Paley	
	54	5,299,810	4/5/1994	Pierce et al.	
	55	5,309,140	5/3/1994	Everett, Jr. et al.	
	56	5,334,027	8/2/1994	Wherlock	
	57	5,354,162	10/11/1994	Burdea et al.	
	58	5,388,992	2/14/1995	Franklin et al.	
	59	5,399,091	3/21/1995	Mitsumoto	
	60	5,405,152	4/11/1995	Katanics et al.	
	61	5,436,622	7/25/1995	Gutman et al.	
	62	5,437,607	8/1/1995	Taylor	
	63	5,440,183	8/8/1995	Denne	
	64	5,466,213	11/14/1995	Hogan et al.	
	65	5,547,382	8/20/1996	Yamasaki et al.	
	66	5,565,840	10/15/1996	Thorner et al.	
	67	5,575,761	11/19/1996	Hajianpour	
	68	5,580,251	12/3/1996	Gilkes et al.	
	69	5,583,478	12/10/1996	Renzi	
	70	5,587,937	12/24/1996	Massie et al.	
	71	5,589,828	12/31/1996	Armstrong	
	72	5,619,180	4/8/1997	Massimino et al.	
	73	5,631,861	5/20/1997	Kramer	
	74	5,643,087	7/1/1997	Marcus et al.	
	75	5,661,446	8/26/1997	Anderson et al.	
	76	5,669,818	9/23/1997	Thorner et al.	
	77	5,684,722	11/4/1997	Thorner et al.	
	78	5,709,219	1/20/1998	Chen et al.	
	79	5,714,978	2/3/1998	Yamanaka et al.	
	80	5,734,373	3/31/1998	Rosenberg et al.	
	81	5,736,978	4/7/1998	Hasser et al.	
	82	5,739,811	4/14/1998	Rosenberg et al.	
	83	5,742,278	4/21/1998	Chen et al.	
	84	5,754,023	5/19/1998	Roston et al.	
	85	5,766,016	6/16/1998	Sinclair et al.	
	86	5,781,172	7/14/1998	Engel et al.	
	87	5,784,052	7/21/1998	Keyson	
	88	5,785,630	7/28/1998	Bobick et al.	
	89	5,790,108	8/4/1998	Salcudean et al.	
	90	5,805,140	9/8/1998	Rosenberg et al.	

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1448A/PTO				Complete if Known	
				Application Number	10/737,400
				Filing Date	December 16, 2003
				First Named Inventor	Louis B. Rosenberg
				Art Unit	Not yet assigned
				Examiner Name	Not yet assigned
Sheet	3	of	7	Attorney Docket Number	IMM103A (51851/295861)

DD	91	5,857,986	1/12/1999	Moriyasu	
	92	5,889,672	3/30/1999	Schuler et al.	
	93	5,894,263	4/13/1999	Shimakawa et al.	
	94	5,897,437	4/27/1999	Nishiumi et al.	
	95	5,914,705	6/22/1999	Johnson et al.	
	96	5,945,772	8/31/1999	Macnak et al.	
	97	5,973,670	10/26/1999	Barber et al.	
	98	5,984,880	11/16/1999	Lander et al.	
	99	5,986,643	11/16/1999	Harvill et al.	
	100	6,001,014	12/14/1999	Ogata et al.	
	101	6,004,134	12/21/1999	Marcus et al.	
	102	6,044,646	4/4/2000	Silverbrook	
	103	6,078,126	6/20/2000	Rollins, et al.	
	104	6,088,017	7/11/2000	Tremblay et al.	
	105	6,088,019	7/11/2000	Rosenberg	
	106	6,104,158	8/15/2000	Jacobus et al.	
	107	6,111,577	8/29/2000	Zilles et al.	
	108	6,160,489	12/12/2000	Perry et al.	
	109	6,184,868	2/6/2001	Shahoian et al.	
	110	6,198,206	3/6/2001	Saarmaa et al.	
	111	6,211,861	4/3/2001	Rosenberg et al.	
	112	6,219,034	4/17/2001	Elbing, et al.	
	113	6,275,213	8/14/2001	Tremblay et al.	
	114	6,317,032	11/13/2001	Oishi	
	115	6,422,941	7/23/2002	Thorner et al.	
	116	6,424,333	7/23/2002	Tremblay et al.	
	117	6,585,595	7/1/2003	Soma	
	118	2002/0030663 A1	3/14/2002	Tierling et al.	
	119	Application 09/968,725	9/28/2001	Schena	

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Country Code <sup>3</sup> - Number <sup>4</sup> - Kind Code <sup>5</sup> (if known)				
DD	120	EP	0349086	1/3/1990	Stork Kwant B.V.	
	121	EP	0626634A2	5/11/1994	Matsushita Electric Industrial Co., Ltd.	
	122	EP	0265011A1	10/12/1987	Oce'-Nederland B.V.	
	123	JP	H2-185278	7/19/1990	Taito Corporation	
	124	JP	H4-8381	1/13/1992	Epoch Co. and Key- Planning Co.	
	125	JP	H5-192449	8/3/1993	Taito Corporation	
	126	JP	H7-24147	1/27/1995	Sega Corporation	

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO				<i>Complete if Known</i>	
<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> <i>(Use as many sheets as necessary)</i>				Application Number	10/737,400
Sheet	4	of	7	Filing Date	December 16, 2003
				First Named Inventor	Louis B. Rosenberg
				Art Unit	Not yet assigned
				Examiner Name	Not yet assigned
				Attorney Docket Number	IMM103A (51851/295861)

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Country Code <sup>2</sup> - Number <sup>3</sup>	Kind Code <sup>4</sup> (if known)			
JD	127	WO 92/00559		1/9/1992	Hewlett-Packard Company	
	128	WO 01/03105A1		1/11/2001	Immersion Corporation	
	129	WO 01/13354A1		2/22/2001	Immersion Corporation	
	130	WO 01/24158A1		4/5/2001	Immersion Corporation	

OTHER DOCUMENTS		
Examiner Initials *	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
JD	131	ADELSTEIN, "A Virtual Environment System For The Study of Human Arm Tremor," Ph.D. Dissertation, Dept. of Mechanical Engineering, MIT, June 1989.
	132	ADELSTEIN, " Design and Implementation of a Force Reflecting Manipulandum for Manual Control research," DSC-Vol. 42, Advances in Robotics, Edited by H. Kazerooni, pp. 1-12, 1992.
	133	AUKSTAKALNIS et al., "Silicon Mirage: The Art and Science of Virtual Reality," ISBN 0-938151-82-7, pp. 129-180, 1992.
	134	BAIGRIE, "Electric Control Loading - A Low Cost, High Performance Alternative," Proceedings, pp. 247-254, November 6-8, 1990.
	135	BEJCZY et al., "Kinesthetic Coupling Between Operator and Remote Manipulator," International Computer Technology Conference, The American Society of Mechanical Engineers, San Francisco, CA, August 12-15, 1980.
	136	BEJCZY, "Sensors, Controls, and Man-Machine Interface for Advanced Teleoperation," Science, Vol. 208, No. 4450, pp. 1327-1335, 1980.
	137	BEJCZY, "Generalization of Bilateral Force-Reflecting Control of Manipulators," Proceedings Of Fourth CISM-IFTMM, Sep. 8-12, 1981.
	138	BEJCZY, et al., "Universal Computer Control System (UCCS) For Space Telerobots," CH2413-3/87/0000/0318501.00 1987 IEEE, 1987.
	139	BEJCZY et al., "A Laboratory Breadboard System For Dual-Arm Teleoperation," SOAR '89 Workshop, JSC, Houston, TX, July 25-27, 1989.
	140	BLISS, "Optical-to-Tactile Image Conversion for the Blind," IEEE Transactions on Man-Machine Systems, Vol. MMS-11, No. 1, March 1970.

Substitute for form 1449A/PTO				Complete if Known	
<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>				<i>Application Number</i>	10/737,400
(Use as many sheets as necessary)				<i>Filing Date</i>	December 16, 2003
				<i>First Named Inventor</i>	Louis B. Rosenberg
				<i>Art Unit</i>	Not yet assigned
				<i>Examiner Name</i>	Not yet assigned
Sheet	5	of	7	<i>Attorney Docket Number</i>	IMM103A (51851/295861)

DP	141	BROOKS et al., "Hand Controllers for Teleoperation - A State-of-the-Art Technology Survey and Evaluation," JPL Publication 85-11; NASA-CR-175890; N85-28559, pp. 1-84, 03/1/1985.
	142	BURDEA et al., "Distributed Virtual Force Feedback, Lecture Notes for Workshop on Force Display in Virtual Environments and its Application to Robotic Teleoperation," 1993 IEEE International Conference on Robotics and Automation, pp. 25-44, 05/02/1993.
	143	CADLER, "Design of A Force-Feedback Touch-Introducing Actuator For Teleoperator Robot Control," Bachelor of Science Thesis, MIT, June 23, 1983.
	144	CALDWELL et al., " Enhanced Tactile Feedback (Tele-Taction) Using a Multi-Functional Sensory System," 1050-4729/93, pp. 955-960, 1993.
	145	"Cyberman Technical Specification," Logitech Cyberman SWIFT Supplement, 4/5/1994.
	146	EBERHARDT et al., "OMAR - A Haptic display for speech perception by deaf and deaf-blind individuals," IEEE Virtual Reality Annual International Symposium, Seattle, WA, Sep. 18-22, 1993.
	147	EBERHARDT et al., "Including Dynamic Haptic Perception by The Hand: System Description and Some Results," DSC-Vol. 55-1, Dynamic Systems and Control: Volume 1, ASME 1994.
	148	GOBEL et al., "Tactile Feedback Applied to Computer Mice," International Journal of Human-Computer Interaction, Vol. 7, No. 1, pp. 1-24, 1995.
	149	GOTOW et al., " Controlled Impedance Test Apparatus for Studying Human Interpretation of Kinesthetic Feedback," WA11-11:00, pp. 332-337
	150	HOWE, "A Force-Reflecting Teleoperated Hand System for the Study of Tactile Sensing in Precision Manipulation," Proceedings of the 1992 IEEE International Conference on Robotics and Automation, Nice, France, May 1992.
	151	IBM Technical Disclosure Bulletin, "Mouse Ball-Actuating Device With Force and Tactile Feedback," Vol. 32, No. 9B, February 1990.
	152	IWATA, "Pen-based Haptic Virtual Environment," 0-7803-1363-1/93 IEEE, pp 287-292, 1993.
	153	JACOBSEN et al., "High Performance, Dextrous Telerobotic Manipulator With Force Reflection," Intervention/ROV '91 Conference & Exposition, Hollywood, Florida, May 21-23, 1991.
	154	JOHNSON, "Shape-Memory Alloy Tactile Feedback Actuator," Armstrong Aerospace Medical Research Laboratory, AAMRL-TR-90-039, August, 1990.
	155	JONES et al., "A perceptual analysis of stiffness," ISSN 0014-4819 Springer International (Springer-Verlag); Experimental Brain Research, Vol. 79, No. 1, pp. 150-156, 1990.
	156	KACZMAREK et al., "Tactile Displays," Virtual Environment Technologies.
	157	KONTARINIS et al., "Display of High-Frequency Tactile Information to Teleoperators," Telemannipulator Technology and Space Telerobotics, Won S. Kim, Editor, Proc. SPIE Vol. 2057, pp. 40-50, Sep. 7-9, 1993.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO				<i>Complete if Known</i>	
<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> <i>(Use as many sheets as necessary)</i>				<i>Application Number</i>	10/737,400
				<i>Filing Date</i>	December 16, 2003
				<i>First Named Inventor</i>	Louis B. Rosenberg
				<i>Art Unit</i>	Not yet assigned
				<i>Examiner Name</i>	Not yet assigned
				<i>Attorney Docket Number</i>	IMM103A (51851/295861)
Sheet	6	of	7		

DD	158	KONTARINIS et al., "Tactile Display of Vibratory Information in Teleoperation and Virtual Environments," PRESENCE, 4(4):387-402, 1995.
	159	LAKE, "Cyberman from Logitech," GameBytes, 1994.
	160	MARCUS, "Touch Feedback in Surgery," Proceedings of Virtual Reality and Medicine The Cutting Edge, Sep. 8-11, 1994.
	161	MCAFEE, "Teleoperator Subsystem/Telerobot Demonsdrator: Force Reflecting Hand Controller Equipment Manual," JPL D-5172, pp. 1- 50, A1-A36, B1-B5, C1-C36, January 1988.
	162	MINSKY, "Computational Haptics: The Sandpaper System for Synthesizing Texture for a Force-Feedback Display," Ph.D. Dissertation, MIT, June 1995.
	163	OUH-YOUNG, "Force Display in Molecular Docking," Order No. 9034744, p. 1-369, 1990.
	164	OUH-YOUNG, "A Low-Cost Force Feedback Joystick and Its Use in PC Video Games," IEEE Transactions on Consumer Electronics, Vol. 41, No. 3, August 1995.
	165	OUHYOUNG et al., "The Development of A Low-Cost Force Feedback Joystick and Its Use in the Virtual Reality Environment," Proceedings of the Third Pacific Conference on Computer Graphics and Applications, Pacific Graphics '95, Seoul, Korea, 21-24 August 1995.
	166	PATRICK et al., "Design and Testing of A Non-reactive, Fingertip, Tactile Display for Interaction with Remote Environments," Cooperative Intelligent Robotics in Space, Rui J. deFigueiredo et al., Editor, Proc. SPIE Vol. 1387, pp. 215-222, 1990.
	167	PATRICK, "Design, Construction, and Testing of a Fingertip Tactile Display for Interaction with Virtual and Remote Environments," Master of Science Thesis, MIT, Nov. 8, 1990.
	168	PIMENTEL et al., "Virtual Reality: through the new looking glass," 2 <sup>nd</sup> Edition; McGraw-Hill, ISBN 0-07-050167-X, pp. 41-202, 1994.
	169	RABINOWITZ et al., "Multidimensional tactile displays: Identification of vibratory intensity, frequency, and contactor area," Journal of The Acoustical Society of America, Vol. 82, No. 4, October 1987.
	170	RUSSO, "The Design and Implementation of a Three Degree of Freedom Force Output Joystick," MIT Libraries Archives 08/14/1990, pp. 1-131, May 1990.

Substitute for form 1449A/PTO				Complete If Known	
<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>				<i>Application Number</i>	10/737,400
(Use as many sheets as necessary)				<i>Filing Date</i>	December 16, 2003
				<i>First Named Inventor</i>	Louis B. Rosenberg
				<i>Art Unit</i>	Not yet assigned
				<i>Examiner Name</i>	Not yet assigned
Sheet	7	of	7	Attorney Docket Number	IMM103A (51851/295861)

DD	171	RUSSO, "Controlling Dissipative Magnetic Particle Brakes in Force Reflective Devices," DSC-Vol. 42, Advances in Robotics, pp. 63-70, ASME 1992.
	172	Safe Flight Instruments Corporation, "Coaxial Control Shaker," Part No. C-25502, 1 July 1967.
	173	SCANNELL, "Taking a Joystick Ride," Computer Currents, Boston Edition, Vol. 9, No. 11, November 1994.
	174	SHIMOGLA, "Finger Force and Touch Feedback Issues in Dexterous Telemanipulation," Proceedings of Fourth Annual Conference on Intelligent Robotic Systems for Space Exploration, Rensselaer Polytechnic Institute, Sep. 30 - Oct. 1, 1992.
	175	SNOW et al., "Model-X Force-Reflecting-Hand-Controller," NT Control No. MPO-17851; JPL Case No. 5348, pp. 1-4, 06/15/1989.
	176	STANLEY et al., "Computer Simulation of Interacting Dynamic Mechanical Systems Using Distributed Memory Parallel Processors," DSC-Vol. 42, Advances in Robotics, pp. 55-61, ASME 1992.
	177	TADROS, "Control System Design for a Three Degree of Freedom Virtual Environment Simulator Using Motor/Brake Pair Actuators", MIT Archive @ Massachusetts Institute of Technology, pp. 1-88, February 1990.
	178	TERRY et al., "Tactile Feedback In A Computer Mouse," Proceedings of Fourteenth Annual Northeast Bioengineering Conference, University of New Hampshire, March 10-11, 1988.
	179	WIKER, "Teletouch Display Development: Phase 1 Report," Technical Report 1230, Naval Ocean Systems Center, San Diego, April 17, 1989.

Examiner Signature	Duc dinh	Date Considered	4/21/06
--------------------	----------	-----------------	---------

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.<sup>1</sup> Applicant's unique citation designation number (optional).<sup>2</sup> See Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 801.04.<sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3).<sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document.<sup>5</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible.<sup>6</sup> Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450. If you need assistance in completing the form, call 1-800-PTO-9199.



PTO/SB/08a (08-03)

Approved for use through 07/31/2006. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE  
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet

1

of

7

## Complete if Known

Application Number	10/737,400
Filing Date	December 16, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	Not yet assigned
Examiner Name	Not yet assigned
Attorney Docket Number	IMM103A (51851/295861)

## U.S. PATENT DOCUMENTS

Examiner Initials *  <i>DD</i>	Cite No. <sup>1</sup>	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number - Kind Code <sup>2</sup> (if known)			
	1	2,972,140	2/14/1961	Hirsch	
	2	3,157,853	11/17/1964	Hirsch	
	3	3,220,121	11/30/1965	Cutler	
	4	3,497,668	2/24/1970	Hirsch	
	5	3,517,446	6/30/1970	Corlyon et al.	
	6	3,623,064	11/23/1971	Kagan	
	7	3,902,687	9/21/1975	Hightower	
	8	3,903,614	9/9/1975	Diamond et al.	
	9	3,911,416	10/7/1975	Feder	
	10	3,919,691	11/11/1975	Noll	
	11	4,160,508	7/10/1979	Salisbury, Jr.	
	12	4,236,325	12/2/1980	Hall et al.	
	13	4,262,549	4/21/1981	Schwellenbach	
	14	4,333,070	6/1/1982	Barnes	
	15	4,414,984	11/15/1983	Zarudiansky	
	16	4,464,117	8/7/1984	Foerst	
	17	4,484,191	11/20/1984	Vavra	
	18	4,513,235	4/23/1985	Acklam et al.	
	19	4,581,491	4/8/1986	Boothroyd	
	20	4,599,070	7/8/1986	Hladky et al.	
	21	4,706,294	11/10/1987	Ouchida	
	22	4,708,656	11/24/1987	de Vries et al.	
	23	4,713,007	12/15/1987	Alban	
	24	4,731,603	3/15/1988	McRae et al.	
	25	4,794,392	12/27/1988	Selinko	
	26	4,795,296	1/3/1989	Jau	
	27	4,868,549	9/19/1989	Affinito et al.	
	28	4,885,565	12/5/1989	Enbach	
	29	4,891,764	1/2/1990	McIntosh	
	30	4,930,770	6/5/1990	Baker	
	31	4,934,694	6/19/1990	McIntosh	
	32	5,019,761	5/28/1991	Kraft	
	33	5,022,384	6/11/1991	Freels et al.	
	34	5,022,407	6/11/1991	Horch et al.	
	35	5,035,242	7/30/1991	Franklin, et al.	
	36	5,038,089	8/6/1991	Szakaly	
	37	5,078,152	1/7/1992	Bond et al.	
	38	5,103,404	4/7/1992	McIntosh	
	40	5,107,262	4/21/1992	Cadoz et al.	
	41	5,146,566	9/8/1992	Hollis, Jr. et al.	
	42	5,165,897	11/24/1992	Johnson	
	43	5,175,459	12/29/1992	Danial et al.	

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

**Complete if Known****INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)

Sheet

2

of

7

<i>DP</i>	Application Number	10/737,400
	Filing Date	December 16, 2003
	First Named Inventor	Louis B. Rosenberg
	Art Unit	Not yet assigned
	Examiner Name	Not yet assigned

Attorney Docket Number IMM103A (51851/295861)

44	5,184,319	2/2/1993	Kramer
45	5,186,629	2/16/1993	Rohen
46	5,186,695	2/16/1993	Mangseth et al.
47	5,203,563	4/20/1993	Loper, III
48	5,212,473	5/18/1993	Louis
49	5,240,417	8/31/1993	Smithson et al.
50	5,271,290	12/21/1993	Fischer
51	5,275,174	1/4/1994	Cook
52	5,283,970	2/8/1994	Aigner
53	5,296,871	3/22/1994	Paley
54	5,299,810	4/5/1994	Pierce et al.
55	5,309,140	5/3/1994	Everett, Jr. et al.
56	5,334,027	8/2/1994	Wherlock
57	5,354,162	10/11/1994	Burdea et al.
58	5,388,992	2/14/1995	Franklin et al.
59	5,399,091	3/21/1995	Mitsumoto
60	5,405,152	4/11/1995	Katanics et al.
61	5,436,622	7/25/1995	Gutman et al.
62	5,437,607	8/1/1995	Taylor
63	5,440,183	8/8/1995	Denne
64	5,466,213	11/14/1995	Hogan et al.
65	5,547,382	8/20/1996	Yamasaki et al.
66	5,565,840	10/15/1996	Thorner et al.
67	5,575,761	11/19/1996	Hajianpour
68	5,580,251	12/3/1996	Gilkes et al.
69	5,583,478	12/10/1996	Renzi
70	5,587,937	12/24/1996	Massie et al.
71	5,589,828	12/31/1996	Armstrong
72	5,619,180	4/8/1997	Massimino et al.
73	5,631,861	5/20/1997	Kramer
74	5,643,087	7/1/1997	Marcus et al.
75	5,661,446	8/26/1997	Anderson et al.
76	5,669,818	9/23/1997	Thorner et al.
77	5,684,722	11/4/1997	Thorner et al.
78	5,709,219	1/20/1998	Chen et al.
79	5,714,978	2/3/1998	Yamanaka et al.
80	5,734,373	3/31/1998	Rosenberg et al.
81	5,736,978	4/7/1998	Hasser et al.
82	5,739,811	4/14/1998	Rosenberg et al.
83	5,742,278	4/21/1998	Chen et al.
84	5,754,023	5/19/1998	Roston et al.
85	5,766,016	6/16/1998	Sinclair et al.
86	5,781,172	7/14/1998	Engel et al.
87	5,784,052	7/21/1998	Keyson
88	5,785,630	7/28/1998	Bobick et al.
89	5,790,108	8/4/1998	Salcudean et al.
90	5,805,140	9/8/1998	Rosenberg et al.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet

3

of

7

**Complete if Known**

Application Number	10/737,400
Filing Date	December 16, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	Not yet assigned
Examiner Name	Not yet assigned
Attorney Docket Number	IMM103A (51851/295861)

DD	91	5,857,986	1/12/1999	Moriyasu	
	92	5,889,672	3/30/1999	Schuler et al.	
	93	5,894,263	4/13/1999	Shimakawa et al.	
	94	5,897,437	4/27/1999	Nishiumi et al.	
	95	5,914,705	6/22/1999	Johnson et al.	
	96	5,945,772	8/31/1999	Macnak et al.	
	97	5,973,670	10/26/1999	Barber et al.	
	98	5,984,880	11/16/1999	Lander et al.	
	99	5,986,643	11/16/1999	Harvill et al.	
	100	6,001,014	12/14/1999	Ogata et al.	
	101	6,004,134	12/21/1999	Marcus et al.	
	102	6,044,646	4/4/2000	Silverbrook	
	103	6,078,126	6/20/2000	Rollins, et al.	
	104	6,088,017	7/11/2000	Tremblay et al.	
	105	6,088,019	7/11/2000	Rosenberg	
	106	6,104,158	8/15/2000	Jacobus et al.	
	107	6,111,577	8/29/2000	Zilles et al.	
	108	6,160,489	12/12/2000	Perry et al.	
	109	6,184,868	2/6/2001	Shahoian et al.	
	110	6,198,206	3/6/2001	Saarmaa et al.	
	111	6,211,861	4/3/2001	Rosenberg et al.	
	112	6,219,034	4/17/2001	Elbing, et al.	
	113	6,275,213	8/14/2001	Tremblay et al.	
	114	6,317,032	11/13/2001	Oishi	
	115	6,422,941	7/23/2002	Thorner et al.	
	116	6,424,333	7/23/2002	Tremblay et al.	
	117	6,585,595	7/1/2003	Soma	
DD	118	2002/0030663 A1	3/14/2002	Tierling et al.	
	119	Application 09/968,725	9/28/2001	Schena	

## FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T <sup>6</sup>
		Country Code <sup>3</sup> - Number <sup>4</sup> - Kind Code <sup>5</sup> (if known)					
DD	120	EP	0349086	1/3/1990	Stork Kwant B.V.		
	121	EP	0626634A2	5/11/1994	Matsushita Electric Industrial Co., Ltd.		
	122	EP	0265011A1	10/12/1987	Oce'-Nederland B.V.		
	123	JP	H2-185278	7/19/1990	Taito Corporation		
	124	JP	H4-8381	1/13/1992	Epoch Co. and Key- Planning Co.		
	125	JP	H5-192449	8/3/1993	Taito Corporation		
	126	JP	H7-24147	1/27/1995	Sega Corporation		

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO				Complete if Known	
				Application Number	10/737,400
				Filing Date	December 16, 2003
				First Named Inventor	Louis B. Rosenberg
				Art Unit	Not yet assigned
				Examiner Name	Not yet assigned
				Attorney Docket Number	IMM103A (51851/295861)
Sheet 4		of 7			

## INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet

4

of

7

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Country Code <sup>3</sup> - Number <sup>4</sup> - Kind Code <sup>5</sup> (if known)				
DD	127	WO 92/00559		1/9/1992	Hewlett-Packard Company	T <sup>d</sup>
	128	WO 01/03105A1		1/11/2001	Immersion Corporation	
	129	WO 01/13354A1		2/22/2001	Immersion Corporation	
DD	130	WO 01/24158A1		4/5/2001	Immersion Corporation	

OTHER DOCUMENTS		
Examiner Initials *	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
DD	131	ADELSTEIN, "A Virtual Environment System For The Study of Human Arm Tremor," Ph.D. Dissertation, Dept. of Mechanical Engineering, MIT, June 1989.
	132	ADELSTEIN, " Design and Implementation of a Force Reflecting Manipulandum for Manual Control research," DSC-Vol. 42, Advances in Robotics, Edited by H. Kazerooni, pp. 1-12, 1992.
	133	AUKSTAKALNIS et al., "Silicon Mirage: The Art and Science of Virtual Reality," ISBN 0-938151-82-7, pp. 129-180, 1992.
	134	BAIGRIE, "Electric Control Loading - A Low Cost, High Performance Alternative," Proceedings, pp. 247-254, November 6-8, 1990.
	135	BEJCZY et al., "Kinesthetic Coupling Between Operator and Remote Manipulator," International Computer Technology Conference, The American Society of Mechanical Engineers, San Francisco, CA, August 12-15, 1980.
	136	BEJCZY, "Sensors, Controls, and Man-Machine Interface for Advanced Teleoperation," Science, Vol. 208, No. 4450, pp. 1327-1335, 1980.
	137	BEJCZY, "Generalization of Bilateral Force-Reflecting Control of Manipulators," Proceedings Of Fourth CISM-IFTOMM, Sep. 8-12, 1981.
	138	BEJCZY, et al., "Universal Computer Control System (UCCS) For Space Telerobots," CH2413-3/87/0000/0318501.00 1987 IEEE, 1987.
	139	BEJCZY et al., "A Laboratory Breadboard System For Dual-Arm Teleoperation," SOAR '89 Workshop, JSC, Houston, TX, July 25-27, 1989.
DD	140	BLISS, "Optical-to-Tactile Image Conversion for the Blind," IEEE Transactions on Man-Machine Systems, Vol. MMS-11, No. 1, March 1970.

Substitute for form 1449A/PTO				<b>Complete if Known</b>	
				<i>Application Number</i>	10/737,400
				<i>Filing Date</i>	December 16, 2003
				<i>First Named Inventor</i>	Louis B. Rosenberg
				<i>Art Unit</i>	Not yet assigned
				<i>Examiner Name</i>	Not yet assigned
Sheet	5	of	7	<i>Attorney Docket Number</i>	IMM103A (51851/295861)

141	BROOKS et al., "Hand Controllers for Teleoperation - A State-of-the-Art Technology Survey and Evaluation," JPL Publication 85-11; NASA-CR-175890; N85-28559, pp. 1-84, 03/1/1985.
142	BURDEA et al., "Distributed Virtual Force Feedback, Lecture Notes for Workshop on Force Display in Virtual Environments and its Application to Robotic Teleoperation," 1993 IEEE International Conference on Robotics and Automation, pp. 25-44, 05/02/1993.
143	CADLER, "Design of A Force-Feedback Touch-Introducing Actuator For Teleoperator Robot Control," Bachelor of Science Thesis, MIT, June 23, 1983.
144	CALDWELL et al., " Enhanced Tactile Feedback (Tele-Taction) Using a Multi-Functional Sensory System," 1050-4729/93, pp. 955-960, 1993.
145	"Cyberman Technical Specification," Logitech Cyberman SWIFT Supplement, 4/5/1994.
146	EBERHARDT et al., "OMAR - A Haptic display for speech perception by deaf and deaf-blind individuals," IEEE Virtual Reality Annual International Symposium, Seattle, WA, Sep. 18-22, 1993.
147	EBERHARDT et al., "Including Dynamic Haptic Perception by The Hand: System Description and Some Results," DSC-Vol. 55-1, Dynamic Systems and Control: Volume 1, ASME 1994.
148	GOBEL et al., "Tactile Feedback Applied to Computer Mice," International Journal of Human-Computer Interaction, Vol. 7, No. 1, pp. 1-24, 1995.
149	GOTOW et al., " Controlled Impedance Test Apparatus for Studying Human Interpretation of Kinesthetic Feedback," WA11-11:00, pp. 332-337
150	HOWE, "A Force-Reflecting Teleoperated Hand System for the Study of Tactile Sensing in Precision Manipulation," Proceedings of the 1992 IEEE International Conference on Robotics and Automation, Nice, France, May 1992.
151	IBM Technical Disclosure Bulletin, "Mouse Ball-Actuating Device With Force and Tactile Feedback," Vol. 32, No. 9B, February 1990.
152	IWATA, "Pen-based Haptic Virtual Environment," 0-7803-1363-1/93 IEEE, pp 287-292, 1993.
153	JACOBSEN et al., "High Performance, Dextrous Telerobotic Manipulator With Force Reflection," Intervention/ROV '91 Conference & Exposition, Hollywood, Florida, May 21-23, 1991.
154	JOHNSON, "Shape-Memory Alloy Tactile Feedback Actuator," Armstrong Aerospace Medical Research Laboratory, AAMRL-TR-90-039, August, 1990.
155	JONES et al., "A perceptual analysis of stiffness," ISSN 0014-4819 Springer International (Springer-Verlag); Experimental Brain Research, Vol. 79, No. 1, pp. 150-156, 1990.
156	KACZMAREK et al., "Tactile Displays," Virtual Environment Technologies.
157	KONTARINIS et al., "Display of High-Frequency Tactile Information to Teleoperators," Telemanipulator Technology and Space Telerobotics, Won S. Kim, Editor, Proc. SPIE Vol. 2057, pp. 40-50, Sep. 7-9, 1993.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO				Complete If Known	
<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>				<i>Application Number</i>	10/737,400
(Use as many sheets as necessary)				<i>Filing Date</i>	December 16, 2003
				<i>First Named Inventor</i>	Louis B. Rosenberg
				<i>Art Unit</i>	Not yet assigned
				<i>Examiner Name</i>	Not yet assigned
Sheet	6	of	7	Attorney Docket Number	IMM103A (51851/295861)

DP	158	KONTARINIS et al., "Tactile Display of Vibratory Information in Teleoperation and Virtual Environments," PRESENCE, 4(4):387-402, 1995.
	159	LAKE, "Cyberman from Logitech," GameBytes, 1994.
	160	MARCUS, "Touch Feedback in Surgery," Proceedings of Virtual Reality and Medicine The Cutting Edge, Sep. 8-11, 1994.
	161	MCAFFEE, "Teleoperator Subsystem/Telerobot Demonsdtrator: Force Reflecting Hand Controller Equipment Manual," JPL D-5172, pp. 1- 50, A1-A36, B1-B5, C1-C36, January 1988.
	162	MINSKY, "Computational Haptics: The Sandpaper System for Synthesizing Texture for a Force-Feedback Display," Ph.D. Dissertation, MIT, June 1995.
	163	OUH-YOUNG, " Force Display in Molecular Docking," Order No. 9034744, p. 1-369, 1990.
	164	OUH-YOUNG, "A Low-Cost Force Feedback Joystick and Its Use in PC Video Games," IEEE Transactions on Consumer Electronics, Vol. 41, No. 3, August 1995.
	165	OUHYOUNG et al., "The Development of A Low-Cost Force Feedback Joystick and Its Use in the Virtual Reality Environment," Proceedings of the Third Pacific Conference on Computer Graphics and Applications, Pacific Graphics '95, Seoul, Korea, 21-24 August 1995.
	166	PATRICK et al., "Design and Testing of A Non-reactive, Fingertip, Tactile Display for Interaction with Remote Environments," Cooperative Intelligent Robotics in Space, Rui J. deFigueiredo et al., Editor, Proc. SPIE Vol. 1387, pp. 215-222, 1990.
	167	PATRICK, "Design, Construction, and Testing of a Fingertip Tactile Display for Interaction with Virtual and Remote Environments," Master of Science Thesis, MIT, Nov. 8, 1990.
	168	PIMENTEL et al., "Virtual Reality: through the new looking glass," 2 <sup>nd</sup> Edition; McGraw-Hill, ISBN 0-07-050167-X, pp. 41-202, 1994.
	169	RABINOWITZ et al., "Multidimensional tactile displays: Identification of vibratory intensity, frequency, and contactor area," Journal of The Acoustical Society of America, Vol. 82, No. 4, October 1987.
DP	170	RUSSO, "The Design and Implementation of a Three Degree of Freedom Force Output Joystick," MIT Libraries Archives 08/14/1990, pp. 1-131, May 1990.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO				<b>Complete if Known</b>	
				<i>Application Number</i>	10/737,400
				<i>Filing Date</i>	December 16, 2003
				<i>First Named Inventor</i>	Louis B. Rosenberg
				<i>Art Unit</i>	Not yet assigned
				<i>Examiner Name</i>	Not yet assigned
Sheet	7	of	7	<i>Attorney Docket Number</i>	IMM103A (51851/295861)

<i>DP</i>	171	RUSSO, "Controlling Dissipative Magnetic Particle Brakes in Force Reflective Devices," DSC-Vol. 42, Advances in Robotics, pp. 63-70, ASME 1992.
	172	Safe Flight Instruments Corporation, "Coaxial Control Shaker," Part No. C-25502, 1 July 1967.
	173	SCANNELL, "Taking a Joystick Ride," Computer Currents, Boston Edition, Vol. 9, No. 11, November 1994.
	174	SHIMOYA, "Finger Force and Touch Feedback Issues in Dexterous Telemanipulation," Proceedings of Fourth Annual Conference on Intelligent Robotic Systems for Space Exploration, Rensselaer Polytechnic Institute, Sep. 30 - Oct. 1, 1992.
	175	SNOW et al., "Model-X Force-Reflecting-Hand-Controller," NT Control No. MPO-17851; JPL Case No. 5348, pp. 1-4, 06/15/1989.
	176	STANLEY et al., "Computer Simulation of Interacting Dynamic Mechanical Systems Using Distributed Memory Parallel Processors," DSC-Vol. 42, Advances in Robotics, pp. 55-61, ASME 1992.
	177	TADROS, "Control System Design for a Three Degree of Freedom Virtual Environment Simulator Using Motor/Brake Pair Actuators", MIT Archive © Massachusetts Institute of Technology, pp. 1-88, February 1990.
	178	TERRY et al., "Tactile Feedback In A Computer Mouse," Proceedings of Fourteenth Annual Northeast Bioengineering Conference, University of New Hampshire, March 10-11, 1988.
<i>DP</i>	179	WIKER, "Teletouch Display Development: Phase 1 Report," Technical Report 1230, Naval Ocean Systems Center, San Diego, April 17, 1989.

Examiner Signature	<i>Buckmire</i>	Date Considered	4/21/06
--------------------	-----------------	-----------------	---------

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. <sup>1</sup>Applicant's unique citation designation number (optional). <sup>2</sup>See Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. <sup>3</sup>Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup>For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup>Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup>Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450. If you need assistance in completing the form, call 1-800-PTO-9199